EDITORIAL ARTICLES.

GONNESCO ON INTERNAL RETRO-PERITONEAL HERNIÆ

The subject of herniæ occurring into normal depressions and openings of the peritoneal folds is exhaustively considered by the author, Dr. T. Gonnesco, of Paris, in a brochure of 299 pages. In view of the little attention which is usually given to this subject, a full resumé of the points brought out in this systematic treatise is herewith given. Four varieties are described, as follows:

1. Duodenal hernia, developed in the fossæ of the duodenal region.
2. Pericæcal herniæ, developed in the pericæcal fossæ.
3. Intersigmoid herniæ, developed in the intersigmoid fossa.
4. Hernia through the foramen of Winslow, situated in the cavity behind the omentum.

The anatomical relations and the pathological anatomy of each of these varieties is then discussed, followed by observations as to etiology, symptoms, diagnosis and treatment. We shall take them up in turn, as given by the author.

I. Duodenal Herniæ. Anatomical Relations.

On lifting up the transverse mesocolon, and spreading out to the right the small intestines, the ascending portion of the duodenum is exposed. To the left of this portion of the duodenum the peritoneal fossæ are located.

1. Inferior Duodenal Fossa.—This is the most frequent, having been observed in 73% of cases. Situated along the beginning portion of the duodenum, it has the form of a cornucopia embracing the intestine in its concavity. The top of the fossa is directed to the right and touches the root of the mesentery; its orifice is directed upward

and is circumscribed by the free border of the inferior duodenal fold. This fold, of triangular form, presents a free falciform border, with its concavity directed upward and its two extremities lost; the right on the anterior surface of the duodenum, the left on the peri-renal peritoneum. Being without fat or vessels it forms a delicate curtain. The peritoneal cul-de sac is therefore limited on the left and in front by this fold, on the right by the ascending intestine, and behind it rests upon the left side of the third lumbar vertebra. Its depth is about 3 cm. The size of the orifice is variable, admitting generally the index finger. The inferior mesenteric vein always passes along its left adherent border. The left colic artery is some distance from the upper part of the fold. These two vessels crossing some distance from the fossa turn downward and to the left. The fossa is thus quite isolated of all vessels, and is practically non-vascular.

It sometimes occurs that the free border of the orifice of this inferior fossa continues around to the left and is continuous with the free border of the upper fossa, thus forming a single circular orifice which opens into both the upper and lower fossæ.

2. SUPERIOR DUODENAL FOSSA.—It exists in 50% of cases. Very frequently it is seen coincident with the inferior fossa. It is always situated opposite the upper end of the ascending portion of the duodenum. This is an inverted fossa, the orifice looking downward and directly opposite the lower fossa. The orifice is limited by a fold of peritoneum. The superior duodenal fold is triangular and forms the anterior wall of the fossa. It presents a free semilunar lower border, directed downward, of which the left extremity is continuous with the prerenal peritoneum, and the right horn with the covering of the duodenum. The summit of the fold is lost above in the inferior layer of the transverse mesocolon; its left border is continuous with the prerenal peritoneum; the right is lost upon the intestine. The fossa is limited above by this fold, on the right by the duodenum, it is stopped above by the body of the pancreas, and rests upon the body of the second lumbar vertebra in the angle formed between the left renal vein and the abdominal aorta. It is about two cm. deep. The inferior mesenteric vein comes up on a level with the orifice of the fossa, passes to

the left across the border of the fold and is lost beneath the pancreas above. The vein always passes in the substance of the fold along its free border.

3. DUODENO-JUJUNAL OR MESOCOLIC FOSSA.—The rarity of this fossa (5 in 30) is explained by the fact that its existence necessitates the penetration of the duodeno jejunal angle into the substance of the root of the transverse mesocolon. In five cases it was simple in four, and double in one, that of a child two and a half years of age.

a. The Single Fossa.—On lifting up the mesocolon and drawing forward and to the right the jejunum, the duodeno mesocolic folds or ligaments extending between the duodeno-jejunal angle and the mesocolon are exposed. These two folds are formed by the passage of the two leafs of mesentery into the mesocolon. Limited by these folds in one part, by the back of the duodeno jejunal angle in the other part, and finally the inferior mesenteric vein, appears an almost circular orifice which leads into a deep fossa. This fossa sinks into the root of the mesocolon, and is engaged in a prevertebral space corresponding to the second lumbar vertebra, and limited above by the pancreas, on the right by the aorta, on the left by the kidney of that side. Coursing along under this cavity is the renal vein. The orifice admits the little finger. The depth of the fossa varies between 2 and 3 cm.

b. The Double Fossa.—Rarely a third fold is present, giving rise to two fossæ.

Pathological anatomy.—From an anatomo-pathological and physiological point of view two varieties of duodenal hernia may be distinguished. One is developed and always seated especially in the left half of the abdominal cavity. This is the ordinary type, first described by Treitz. The other is the rare form which appears in the right side of the abdomen.

LEFT DUODENAL HERNIA.—When the abdomen of a person carrying a duodenal hernia is opened, and the epiploic apron lifted up, one of two things may be observed. Most frequently the whole mass of small intestine is found enclosed in a peritoneal sac. Or, on the other hand, the hernia may be small and concealed by the convolutions of intestine, and finally discovered against the left side of the vertebral

column, near the root of the transverse mesocolon, containing a small loop of small intestine. Between these two extremes are many gradations. The variety of size permits of the dividing of duodenal hernia into three groups: small, medium, and large, or complete.

The small herniæ described by Treitz contained from 2 to 5 cm. of jejunum. Rarely they remain this size. There is a tendency to increase until the full development is reached. Ordinarily the sac becomes larger and larger, and presently it occupies much of the abdominal cavity, and contains the whole length of small intestine. It is in these cases that one does not see more, on opening the abdominal cavity, than a serous sheet covering the whole mass of small intestine, and covered in its turn by the large intestine. The volume of the sac varies from that of a small nut to that of the head of an adult, or larger, occupying the largest part of the abdominal cavity. The hernial sac begins to develop to the left of the vertebral column. It rests upon the left renal vessels, on the psoas muscle, and presents with the left kidney relations which vary with the size of the hernia. Above it is the pancreas and the root of the transverse mesocolon. Thus the posterior wall of the sac of a small hernia extends between the pancreas above, the lower extremity of the left kidney below, the vertebral column and the abdominal aorta within. As the sac increases it extends upward, downward and to the left, and finally encroaches upon the right half of the abdominal cavity. In a complete hernia the abdomen is more or less distended. As this great serous sac surrounds it, the intestine preserves its normal position. The sac completely fills the middle of the abdomen and is surrounded by the large intestine in its course. It does occur that the great sac enclosing the small intestine may have the transverse colon around its lower border, and be bounded above by the stomach. Or the whole mass of great intestine may lie to the right of the sac.

The orifice of the sac has a variable relation to the abdominal wall. The variations depend on the volume of the hernia. In a general way it may be said that the orifice is situated in that portion of the abdomen which corresponds to the location of the duodenal fossæ. In the case of large herniæ the orifice is apt to be to the right of the vertebral

column, low down in the iliac fossa near the sacrum. The orifice averages 6 cm. long and 4 cm. broad, admitting two to four fingers. The anterior border is free, the posterior adherent.

The true sac is formed of a single serous layer. The second layer which covers the free portion of its circumference is nothing more than a superadded leaf. The duodenal fossæ have their anterior wall formed by a serous layer composed of two laminæ, of which one invaginates to form the fossa, and the other is continued on the peritoneal layer of the duodenal region, which is a continuation of the layers of the different mesos which enclose this region. The mesentery of the intestine contained in the sac is continuous with the internal layer of the sac. The free border of the hernial orifice is formed by a reflection of the external layer upon the internal; thus it represents a peritoneal fold formed of two layers. The two pillars or corners of this fold loose themselves, one on the right or upper layer, the other on the left or lower of the mesentery of the segment of small intestine which is in the sac.

The vessels about the orifice are numerous. All the free border is surrounded by an artero-venous arch. At the upper part of this border and closely hugging it, the inferior mesenteric vein passes. In the anterior part of the border the left colic vein and artery pass.

The contents of the sac is always small intestine with its mesentery. In the great majority of cases all of the small intestine, excepting the first part of the duodenum and a very small portion of the ilium, is contained in the sac. All of the cases of complete hernia observed have occurred in persons between the ages of 22 and 58 years, whereas the incomplete herniæ have been observed in those from 2 months to 19 years of age. If the hernia is small it is always the jejunum which is herniated; and the jejunum with a portion of the ilium if the hernia is larger. The intestine commences to introduce itself by a part of the duodenum or the duodeno-jejunal angle. The herniated gut does not present much change. Most frequently it becomes distended by gas. This may be the cause of more or less obstruction in the intestinal canal. Adhesions may take place. A chronic peritonitis of the sac and its orifice is observed in a certain number of cases. It causes

adhesions between the sac and the neighboring organs or with the abdominal or pelvic wall. Adhesions may occur between the orifice of the sac and the intestines which pass through it. The cæcum may become adherent to the orifice and completely plug it. In case of strangulation the seat of the trouble is always the neck of the sac. The lesions are the same as in all cases of strangulated hernia, external or internal. Invagination of the herniated gut has been observed in three cases of duodenal hernia.

In a great number of cases of non-strangulated duodenal hernia, discovered by chance at the autopsy, there has been observed a congestion, more or less intense, of the abdominal viscera. The organ found most congested was the spleen. The liver, the left kidney and other viscera have been found greatly congested. Dilatation of the hæmorrhoidal veins has been frequently observed. These are signs of venous obstruction from pressure of the tumor.

RIGHT DUODENAL HERNIA.—Much that has been said above applies also to this variety of hernia. There are but eight recorded cases of this class. The hernia is located in the right half of the abdominal cavity. The hernial sac passes in front of the vertebral column over into the left side of the abdomen. It has around it the colon. The orifice is situated in front of the third lumbar vertebra, and presents a variable diameter, averaging about two inches. The free anterior border of the orifice is semilunar with its concavity turned to the left or directed backward. The upper horn reaches the side of the terminal portion of the duodenum to loose itself in its serous layer. The duodenum enters the sac at the upper part without passing around the pillar of the orifice. The inferior pillar has passing around it the terminal portion of the ilium which penetrates into the sac. The posterior wall of the hernia rests upon the vena cava, the right psoas, the right renal vessels, the anterior surface of the right kidney and ureter. The anterior wall is formed of two serous layers, one external, the other internal, which are reflected the one upon the other at the free border of the orifice. Leaving this orifice the external layer passes to the right and reaches the internal border of the ascending colon, passes over the two-thirds of the circumference of the latter, afterward to

the right of this, and is lost on a level with the external border of the right kidney in the parietal peritoneum. This layer is thus formed by two layers of the ascending mesocolon, separated by the hernial sac. Above and to the right the external layer is continuous with the right colic angle, and the half or more of the transverse colon covers the colon and continues as the upper layer of its meso. So the hernial sac in these cases is developed beneath the internal layers of the ascending mesocolon and a portion of the inferior layer of the transverse mesocolon; this explains the adherence of the sac to the ascending colon, to the right colic angle and to the right segment of the transverse colon. As to the internal layer, it lines the external, and leaves it at the right inferior and superior borders of the sac to be continued with the single layer which forms the posterior wall, adherent to the sac.

The superior mesenteric artery, leaving the aorta near the lower part of the duodenum, passes into the superior pillar of the free border of the orifice and ramifies throughout this fold between the two serous layers which form it. From the convexity of the artery spring the branches to the small intestine, which pass into the substance of the mesentery and with it into the sac. From the concave border the colic arteries, which pass between the two layers of the anterior wall of the sac in describing their ordinary courses, pass to the front of the ascending colon and the right segment of the transverse.

All of the small intestine is contained in the sac. A single intestinal tube emerges by the orifice at its lower part; this is the terminal portion of the ilium. When the ilium turns about the border of the orifice to meet the cæcum, it presents a slight twist upon its axis. The duodenum enters the sac at its upper part, not through the orifice, but by lifting up the posterior wall of the sac. Soon it separates from this wall and continues into the jejunum The mesentery of the small intestine adheres to all of the periphery of the free border of the orifice of the sac.

The anatomical conditions necessary for the production of retro-peritoneal hernia are (1), a dilatable excavation in the peritoneum; (2) a resisting ring; (3) a movable intestine pressing against this ex-

cavation. The peritoneum must be loose, the sub-peritoneal areolar tissue must not be dense. The resisting ring must be bordered by a vascular arc. Sometimes the jejunum at its upper part is fixed, being enveloped by the inferior layer of the transverse mesocolon. When this condition prevails duodenal hernia is impossible. Treitz placed a section of small intestine partly under an inverted vase, and on passing water through it from without inward, observed that the intestine slowly passed beneath the vase.

As right duodenal hernia occurs in the inferior duodenal non-vascular fossa, its formation demands explanation. The ascending portion of the duodenum presses against the external or anterior wall of the fossa. The duodeno-jejunal angle, poorly supported by the muscle of Treitz, sinks down and thus favors the displacement of the ascending portion of the duodenum. This sinks and presses forward the inferior duodenal serous fold. Thus little by little the serous cul-de sac is pressed from left to right and from above downward. This fossa has no immediate relation with the arterio-venous sac above mentioned. The serous pouch, instead of forcing itself beneath, passes over it. The pouch once formed continues to develop in the direction of the least resistance between the root of the mesentery and the post-abdominal wall. It is directed to the right, and passes beneath the internal layers of the ascending mesocolon and inferior layer of the transverse. With the progress of the hernia the orifice elongates more and more; the free border, limited by the serous fold, is displaced downward and to the left. Soon the orifice of the hernial sac is limited in front, not by the free border of the inferior fold, but by the root of the mesentery, beneath which is engaged the hernial sac. In the free border of this orifice the superior mesenteric artery passes along to the root of the mesentery. The intestine thus engaged has to submit to a torsion around this root of the mesentery.

In a word, the herniated small intestine is completely reversed, and situated behind the root of its mesenteric pedicle which attaches it to the free border of the hernial orifice, in place of fixing it to the posterior wall of the sac as in left duodenal herniæ.